

## Enhanced L/D and Virtual Shaping of NLF Sections, Phase I

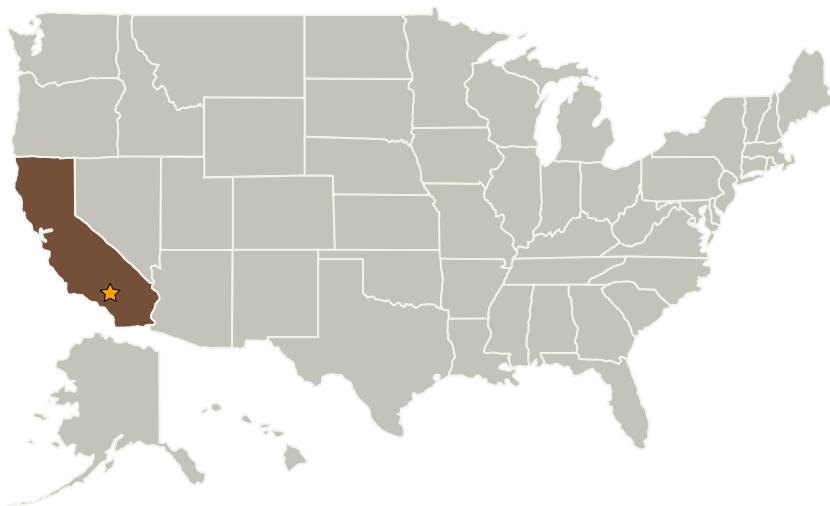
Completed Technology Project (2006 - 2006)



## Project Introduction

A robust flow control method promising significantly increased performance and virtual shape control for natural laminar flow (NLF) sections is proposed using a novel momentum porting concept. Significant aerodynamic, systems, and control benefits are possible through the integration of virtual aerodynamic shaping technology into modern aircraft. Virtual aerodynamic shaping involves using flow control technology to manipulate the flow field to achieve a desired result regardless of the geometry. A high-payoff approach to significantly increased air vehicle performance is the use of a novel momentum porting concept for the virtual shaping of extended run natural laminar flow sections. The objective of this research is to incorporate a robust and simple tangential pulsed jet blowing system that requires no external air to design and virtually shape an extended natural laminar flow section offering radical performance enhancement in the form of increased lift-to-drag and maximum lift. Additionally, the system will produce a wing design enabling a hinge-less, full-span virtual shaping capability which can be used for fully pilot reactive roll control, span load tailoring, and gust load alleviation. The system will provide significantly enhanced performance for the air vehicle throughout the entire flight envelope.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Armstrong Flight Research Center (AFRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Armstrong Flight Research Center(AFRC)	Lead Organization	NASA Center	Edwards, California
Rolling Hills Research Corporation	Supporting Organization	Industry	El Segundo, California

## Primary U.S. Work Locations

California

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX15 Flight Vehicle Systems
  - └ TX15.1 Aerosciences
    - └ TX15.1.3 Aeroelasticity